VGA-COMPATIBLE

VIDEO GRAPHICS CONTROLLER

USER'S MANUAL

(VGA–1)

TABLE OF CONTENTS

®IBM PC, PC-XT, AT are registered trademarks of International Business Machines Corporation.

SECTION 1 OVERVIEW

1.1 FEATURES:

- Signal chip VGA graphics for IBM PC/XT/AT compatible system.
- 100% hardware compatible with IBM VGA in all mode.
- EGA, CGA, MDA and Hercules graphics compatible through emulator.
- Fast host access to video memory.
- 32-bit video RAM access.
- Supports variable frequency monitors.
- 800 X 600 high resolution color mode with 16 colors.
- Support 132-column text mode.
- Scan line doubling.
- 256 K bytes memory configuration.
- 35.5 MHz dot clock.
- Analog and Digital connectors.
- Fully compatible with IBM basic input/output system(BIOS).

1.2 OVERVIEW

The Video Graphics Array (VGA) is a medium resolution monitor adapter for the IBM PC/XT and AT. It has more functions than IBM VGA Adapter. This VGA card emulates the adapter standard for the IBM Monochrome Display Adapter (MDA), Hercules Graphics IBM Color Graphic Adapter (CGA), IBM Enhanced Graphics Adapter (EGA) and IBM Video Graphics Array (VGA).

Operating at dot clock rates up to 35.5 MHz,the UM587 chip set supports high resolution graphics and alphanumeric display mode for both monochrome and color, and for high resolution variable frequency monitors. video outputs are provided in 4 bits per pixel (all resolutions) and 8 bits per pixel (320 x 200). Using analog video output and an external palette, selection may be made from 256K colors.

1

SECTION 2 INSTALLATION

2-1 PHYSICAL INSTALLATION PROCEDURE

Once you have properly set the switches see section 4 switch setting you can install the VGA board in any open expansion slot of your computer system. Follow the steps outlined below:

1. Prepare your computer system.
   a. Turn off the power to the computer system, and unplug the power cord.
   b. Disconnect all cables connected to the computer system
   c. Using a screwdriver (or nut driver), remove the cover mounting screws. These screws are at the rear of a PC PC/XT and PC/AT, and on each side (lower edge) of a PS/2 Model 30.
   d. Remove the computer system's cover.

2. If you are installing the VGA board in a PC, PC/XT, or PC/AT configure the computer system for the type of monitor you'll be using. (If you're using a PS/2 Model 30, skip this step and go on to step 3.) The computer can be configured for Monochrome, Color or No display is used to enable a VGA board or EGA board to boot up properly. Refer to your system manual and follow the steps below:

   a. Locate the monitor selection switch(es) on the computer's motherboard.

   * In an IBM PC, locate switches 5 and 6. They are located in switch block 1, which is the DIP switch on the left(closest to the expansion slots).

   * In an XT, locate switches 5 and 6. They are located in the switch block near the slot J8 connector.

   * In an AT, there is only one switch for monitor selection the switch is labeled SW1 and is located next to the 80287 socket in most ATs.

   b. If you are using a PC or PC/XT, set switches 5 and 6 to ON This configures your PC for No Display. Do NOT change any other switches.

> **CAUTION:**
>
> *Failure to set switches 5 and 6 on PC and XT motherboards to the on position may result in severe damage to your monitor.*

c. If you are installing the VGA board in an AT and ant to use a color monitor, set Switch 1 back(toward the rear of the AT, set Switch 2 forward (toward the front of the AT).

3. Insert the VGA board into your computer.

PC, PC/XT AND PC/AT SYSTEMS:

a. Find an empty expansion slot for the VGA board. If the slot still has the metal expansion-slot cover attached, remove the cover with a screwdriver (or nut driver).

b. Hold the VGA board firmly at the top edge of the board, and press the gold connector into an empty expansion slot.

c. Line up the VGA board retaining bracket with the screw hole in the rear plate of the computer system.

d. Using a screwdriver (or nut driver), screw the retaining bracket tightly against the rear plate of the computer system.

PS/2 MODEL 30 SYSTEM ONLY:

a. Find an empty expansion slot for the VGA board, If the slot still has the metal expansion-slot cover attached, remove the cover with a screwdriver (or nut driver). Save the screw to install the VGA board.

b. At the rear of the case, remove the plastic insert from the location desired for the VGA board.

c. Hold the VGA board by the edges, and align it with the system's support brackets.

d. Firmly press the VGA board into the expansion slot.

e. To secure the board, install the expansion-slot screw you remove in step a.

4. Reassemble the computer system :

   a. Replace the cover on the computer, and plug in the power cord.

   b. If you have a PC/AT, reinstall the back panel by pressing the plastic fastening strips together.

   c. Reconnect all cables that were previously attached to the rear of the computer.

2-2 MONITOR CABLES

The VGA board has a 9-pin cable connector (commonly referred to as a DB-9 or DE-9 connector) for TTL (digital) monitors, and a 15-pin connector for PS/2-type analog monitors. Multifrequency monitors can be connected to either connector if the monitor is configured to accept the type of signal (TTL or Analog) present at 9 connector; analog, however, is the recommended configuration. Colors displayed on a TTL-configured monitor may not be the same as those displayed on an analog monitor, and it will not be possible to display 256 colors simultaneously on a TTL-configured monitor.

• •

NOTES

All multi-frequency monitors have a switch that must be set to specify connection to either a digital or analog connector. For example, if you connect a multi-frequency monitor to the DB-9 connector on VGA board you must set the monitor switch to reflect a digital connection. Analog is recommended for best results.

• •

For detailed information on monitor types, prefer to the section 3 support monitor and specification.

CAUTION:

The VGA board has the same 15-pin connector available from monitor manufacturers to interface with IBM PS/2 computers. Using an incorrect cable may result in damage to the monitor and/or adapter. If you have an older multi-frequency monitor with a 9-pin analog connector, you must purchase a 9-to-15-pin converter. Attaching a 9-pin cable from an analog connector on your monitor to the 9-pin (TTL) connector on the VGA board will not work. Please also note that different cables from different monitor suppliers are not interchangeable (e.g., the Sony Multiscan has different wiring than the NEC Multisync). contact your dealer or the monitor manufacturer for specific cable information.

TABLE 1 : PIN ASSIGNMENTS FOR VGA BOARD OUTPUT CONNECTORS

MONOCHROME DISPLAY PIN OUTS:

PIN #	ASSIGNMENT	PIN #	ASSIGNMENT
1	Ground	6	Intensity
2	Ground	7	Video
3	N/A	8	Horizontal sync (+)
4	N/A	9	Vertical Sync (-)
5	N/A		

COLOR DISPLAY PIN OUTS:

PIN #	ASSIGNMENT	PIN #	ASSIGNMENT
1	Ground	6	Intensity
2	Ground	7	N/A
3	Red	8	Horizontal Sync (+)
4	Greed	9	Vertical Sync (-)
5	Blue		

ENHANCED COLOR DISPLAY & MULTI-FREQUENCY PIN OUTS:

PIN #	ASSIGNMENT	PIN #	ASSIGNMENT
1	Ground	6	Green
2	Red	7	Blue
3	Red	8	Horizontal Sync (+)
4	Green	9	Vertical Sync (-)
5	Blue		

ANALOG DISPLAY PIN OUTS:

PIN #	ASSIGNMENT	PIN #	ASSIGNMENT
1	Red (out)	9	(no pin)
2	Green (out)	10	Sync return
3	Blue (out)	11	Mon ID (0) (in)
4	Mon ID(2)(in)	12	Mon ID (1) (in)
5	Ground	13	Horizontal Sync (out)
6	Red return	14	Vertical Sync (out)
7	Green return	15	(reserved)
8	Blue return		

SECTION 3 SUPPORT MONITOR AND SPECIFICATION

The VGA card runs digital and analog monitor including monochrome, color, EGA PS/2 and multi-frequency monitors. So it is used as the monitor adapter for new computer and to replace older, less functional, monitor adapter on computers in use. Two types of monitors used with the VGA card.

3-1 DIGITAL MONITORS

Digital monitors receive data through a nine pin connector. Each pin conducts a different type of signal. Signals include red, green, blue, secondary red, secondary green, secondary blue, horizontal synchronization and vertical synchronization and ground. The signals are transmitted in two states: On or Off. Standard color digital monitors have three electron guns at the rear of the screen. These guns are named red, green and blue and fire electrons at colored phosphorus dots painted on the screen. The dots are red, green and blue. Each gun fires only at dots of a particular color. Each gun responds to signals sent over one or two pins on the monitor signal jack. When a signal is transmitted to the red pin the red gun fires an electron at a red dot on the screen and the dot is illuminated. When a red signal and to the red pin the red gun fires with twice the number of electrons at the dot. The intensity of secondary red signal are transmitted the red gun fires with twice the number of electrons at the dot. The intensity of the light emitted by the phosphor, as interpreted by the human eye and brain, is directly proportional to the number of electrons hitting the single red dot. When the monitor is on; each dot is in one of three states, off, on or intensely. Digital monitors display a fixed number of colors.

Standard digital off signals carry a voltage of 0 to 0.8 volts. Standard On Signals carry a voltage of 0.8 to 3.5 volts. The voltages are dependent on the particular monitor.

The greatest number of colors digital monitors can display at one time is 64. This limit is imposed by the monitor design; not by the monitor adapter.

3-2 ANALOG MONITORS

Analog monitors receive data through a fifteen-pin connector. Each pin carries a different signal. Signals include red, green, blue monitor signals zero, one and two, vertical synchronization, horizontal synchronization and ground.

The standard analog signal varies from 0.0 volts to 1.0 volts. Theoretically there are an infinite number of analog signals that can be transmitted in this range. The digital-to-analog converter on the Enhanced VGA Adapter converts the analog signal to a digital signal. The potential number of digital signals is limited to two hundred fifty six. When the monitor is on each phosphorus dot is illuminated to one of two hundred fifty six intensities. The greatest number of color analog monitors can display at one time is 265.

3-3 SUPPORTED SCREEN FORMATS

```
************
 MODE TABLE
************
```

MODE Type		COLxROW	Colors	Pages	Map Addr.	CharBox
(HEX)					(HEX)	
00	Text	40x25	16	8	B800	8x8
01	Text	40x25	16	8	B800	8x8
02	Text	80x25	16	8	B800	8x8
03	Text	80x25	16	8	B800	8x8
00*	Text	40x25	16	8	B800	8x14
01*	Text	40x25	16	8	B800	8x14
02*	Text	80x25	16	8	B800	8x14
03*	Text	80x25	16	8	B800	8x14
00+	Text	40x25	16	8	B800	9x16
01+	Text	40x25	16	8	B800	9x16
02+	Text	80x25	16	8	B800	9x16
03+	Text	80x25	16	8	B800	9x16
07	Text	80x25	2	8	B800	9x14
07+	Text	80x25	2	8	B800	9x16
04	APA	320x200	4	1	B800	8x8
05	APA	320x200	4	1	B800	8x8
06	APA	640x200	2	1	B800	8x8
0D	APA	320x200	16	8	A000	8x8
0E	APA	640x200	16	4	A000	8x8
0F	APA	640x350	2	2	A000	8x14
10	APA	640x350	16	2	A000	8x14
11	APA	640x480	2	1	A000	8x16
12	APA	640x480	16	1	A000	8x16
13	APA	320x200	256	1	A000	8x8
50	Text	132x25	16	8	B800	8x14
51	Text	132x43	16	5	B800	8x8
52	Text	800x600	16	8	A000	8x8

Remarks:

1). Mode 0,1,2,3 0*,1*,2*,3* 0+,1+,2+,3+ differs in the CharBox size and the display scan line.

2). Mode 3+ or 7+ is the default mode at power up time.

3). Mode 50hm, 51h and 52h are Extended Video Modes added by Oak.

SECTION 4 SWITCH SETTING

The VGA card is designed to support IBM VGA Mode (use 15-pin connector). With the help of 9-pin connector, it supports the extended EGA and CGA modes on the VGA monitor. Also, you can run EGA, CGA and MGA modes on the Respective monitors by setting the switch, listed in the following table:-

SW4	SW3	SW2	SW1	Meaning
ON	X	X	X	IBM VGA monitor
OFF	ON	ON	ON	MDA attached
OFF	ON	ON	OFF	CGA attached
OFF	ON	OFF	ON	EGA Attached
OFF	ON	OFF	OFF	NEC multi monitor
OFF	OFF	ON	ON	NEC plus monitor

NOTE: MDA=Monochrome Display (Hsync=18.4KHz)
       CGA=Color Display (Hsync=15.75KHz)
       EGA= Enhanced Color Display (Hsync=
                  21.85KHz
                  15.75KHz
       X =Don't care

MONITOR TABLE

Supported-MOdes	Digital Monitors			Analog Monitors		
	Monochrom	CGA	EGA	Multi-Frequency	Analog Multi-Frequency	Fixed-Frenquency
0		Y	Y	Y		Y
1		Y	Y	Y		Y
2		Y	Y	Y		Y
3		Y	Y	Y		Y
4		Y	Y	Y		Y
5		Y	Y	Y		Y
6		Y	Y	Y		Y
7	Y		Y	Y		Y
D			Y	Y		Y
E			Y	Y		Y
F	Y		Y	Y		Y
10			Y	Y		Y
11				Y		Y
12				Y		Y
13				Y		Y
50	Y	Y		Y		
51	Y	Y		Y		
52				Y		

SECTION 5 CONNECTORS

5-1 ANALOG SIGNAL CONNECTOR

PIN	I/O	OUTPUT	DISPLAY TYPE MONOCHROME	COLOR
1	O	RED	NO PIN	RED
2	O	GREEN	MONO	GREEN
3	O	BLUE	NO PIN	BLUE
4	NA	RESERVED	NO PIN	NO PIN
5	NA	DIGITAL G	SELF TEST	SELF TEST
6	NA	RED RTN	DUMMY PIN	RED RTN
7	NA	GREEN-RTN	MONO RTN	GREEN RTN
8	NA	BLUE RTN	NO PIN	BLUE RTN
9	NA	PLUG	NO PIN	NO PIN
10	NA	DIGITAL G	DIGITAL G	DIGITAL
11	NA	RESERVED	NO PIN	DIGITAL G
12	NA	RESERVED	DIGITAL G	NO PIN
13	O	HSYNC	HSYNC	HSYNC
14	O	VSYNC	VSYNC	VSYNC
15	NA	RESERVED	NO PIN	NO PIN

RED RTN, GREEN RTN, BLUE RTN = ANALOG GROUNDS
DIGITAL G = DIGITAL GROUND FOR SYNC RETURNS AND SELF TEST

TABLE 5-1 15-PIN D-SHELL DISPLAY CONNECTOR SIGNALS

5-2 DIGITAL SIGNAL CONNECTOR

FIG. 5-2 9 PIN D-SHELL DISPLAY CONNECTOR

PIN NUMBER	SIGNAL NAME
1	SIGNAL GROUND
2	SECONDARY RED/SIGNAL GROUND
3	RED
4	GREEN
5	BLUE
6	SECONDARY GREEN/ITENSITY
7	SECONDARY BLUE/MONOCHROME VIDEO
8	HORIZONTAL SYNC
9	VERTICAL SYNC

TABLE 5-2 9-PIN D-SHELL CONNECTOR SIGNALS

SECTION 6 BACKWARD COMPATIBILITY

Backward compatibility is provided through hardware/firmware emulation. All previous video standards; Monochrome Graphics, Color Graphics and Enchanced Graphics modes are emulated. To activate/deactivate the emulation modes, a program called VGAMODE.EXE is provided.

When VGAMODE is entered at DOS prompt without any parameter, a menu will be displayed to allow the selection of the emulation modes as well as display modes. There is a message at the bottom which explains the action item at the current cursor.

A LOCK/UNLOCK feature allows locking and unlocking of the emulation mode. Locking an emulation mode will cause the VGA to remain in the chosen mode even after a warm reboot. This feature is ideal for the running of those self-bootable game programs.

VGAMODE can also be used with parameter at the DOS prompt.
To select an emulation, type VGAMODE followed by a 'C', 'M', 'E' or 'V' to switch to CGA, MGA, EGA and back to VGA respectively.

C>VGAMODE C	(switch to CGA emulation mode)
C>VGAMODE M	(switch to MGA emulation mode)
C>VGAMODE E	(switch to EGA emulation mode)
C>VGAMODE V	(switch back to normal VGA mode)

To select a display mode, append the mode number (in hex) after VGAMODE.

C>VGAMODE 3	(select mode 3 - 80x25 color text mode)
C>VGAMODE 51	(select mode 51 - 132x43 color text mode)
C>VGAMODE 13	(select mode 13 - 320x200 256 color graphics mode)

VGAMODE is not a memory resident program. The emulation firmware is embedded within the VGA BIOS.

DRIVERS INSTALLATION NOTES

1. WINDOWS (286 Version)

The 800x600 high resolution driver is supported for Windows veriosn 2.xx. The driver name in the Driver Floppy Disk is VGA800.DRV. The installation procedure for this OTI provided 800x600 driver is as follows:

- Insert WINDOWS "set up" diskette into drive A:
- Change your current drive to A: drive if it is not

```
C> A:
A>
```

- Run setup program as follows:

```
A> setup
```

- The setup program will ask you to answer or select the right configuration for each specific area.
- Answer or select the right configuration according to the instruction shown on the screen. When you see this:

"Please select your display adapter from the following list"

= = => Select Other (requires disk provided by a hardware manufacturer)

- Insert OTI DRIVER DISKETTE into A: drive and hit RETURN (or ENTER).

- you should see:

"Here are the display driver on your disk."

= = => Select UMC TECHNOLOGY INC. VGA 800x600 color display"

- After 800x600 driver is installed, just follow the instruction to finish the installation and setup procedure.

2. AutoCAD

The 800x600 driver is supported for autoCAD version 2.xx. The driver name is DSVGA.EXE which is a stay resident program. The procedure to bring up the 800x600 driver is as follows:

- Install your AutoCAD first by following the instructions provided by AutoCAD.
- Run DSVGA on OTI DRIVER DISKETTE in drive A: or copy this file to your AutoCAD directory and run it over there.

```
A> DSVGA
```

- Now the driver is stayed in resident.
- set up your MOUSE driver as usual.
- Bring up AutoCAD by typing in:

```
C> ACAD
```

- When you see main menu on the screen:

= = => Select 5) Configure AutoCAD

- It will show your current configuration on the screen. If your current video display is "ADI display v2.0" then you are set up to run AutoCAD with OTI's 800x600 driver. Now you can go back to main menu and do your work. If your current video display is not "ADI display v2.0" then press RETURN to continue.

- Now you see configuration menu displayed:

= = => Select 3) Configure video display

- After you select 3, it tells your current video display again, and ask you:

"Do you want to select a different one? <N> _".

Answer "Y"es to this question.

- The screen comes up with "Available video displays:" for your new selection.

= = => Select 1) ADI display V2.0

- After this you may have to answer several questions for

your needs.

- It comes back to configuration menu again. Select 0 to exit to main menu.

- Then answer "yes to the question "Keep configuration changes <N>"

- Go back to main menu and do your normal work.

3. GEM/3

The 800x 600 driver is supported for GEM version 3. The driver name is SDVGA8.VGA. Follow the procedure below to set up the 800x600 driver:

- Make a copy of original System Master and Screen Disk #2. Keep the original and use the copied diskettes for installation.

- Insert OTI DRIVER DISKETTE into A: drive and run GEM install batch file:

A> GEMINSTL

- Follow the instructions displayed on the screen until it is finished and exit.

- Insert System Master (not original one) in A: drive and type in:

A> GEMPREP <RETURN>

- = = = > Select "Install new configuration" *<RETURN>*

- Select hard disk drive according to your configuration.

- = = = > Select "Oak Technology Inc. 16-color VGA800" *<RETURN>*

- Select mouse you install.

- Select communication port for your mouse.

- If you have printer installed, = = = > select "Continue" otherwise = = = > select "Save and exit from GEM setup"

- Follow the remaining instruction to finish the GEM set up.

4. VENTURA

The 800x600 driver is supported for Ventura version 1.1. The driver name is SD_VGA_5.VGA. The 800x600 driver installation procedure is as follows:

- If you have not installed the Ventura on your system, then follow the next step to finish the installation first. But if you have already installed Ventura, please skip next part and go to driver installation part.

**** *Ventura Installation* ****

- Insert Ventura Application Disk (disk #1) into A: drive and run VPPREP

A> VPPREP

- Follow the instructions to continue the installation until you see the questions with selection menu:

"Which graphics card and display do you have?"

- = = = > Select any one of them. The driver you select here will be replaced by 800x600 driver later on.

- Continue the installation until it is finished and exit.

**** *800x600 driver installation* ****

- Insert OTI DRIVER DISKETTE into A: drive.

- Run Ventura 800x600 driver installation batch file:

A> VPI1

- Continue the installation procedure until you see:

"Which graphics card and display do you have?"

- = = = > Select A Oak Technology Inc. VGA800 16-color Display

- Type in "A" to the question:

"Type the letter of the graphics card you have: "_

- Continue the remaining installation procedure by instruction

- Now, you are ready to run ventura with OTI's 800x600 driver.

SECTION 8   132-COLUMN TEXT MODE APPLICATIONS

General Informations

The following is a general guide-line on how to prepare installable application programs to run in 132-column text mode:

1) Backup the application before installation.
2) Run the application's installation program and set the display dimensions to 132 columns, save the changes.
3) For convenience, create a batch file to switch video mode to 132-column text mode and then run the application.

Oak VGA supports 132x25 and 132x43 text modes, their mode numbers are (in hex) 50 and 51 respectively. An Oak utility program called VGAMODE.EXE can be used to switch to those modes. For example:

> *VGAMODE 50*   (will switch to 132x25 mode)
> *VGAMODE 51*   (will switch to 132x43 mode)
> *VGAMODE 3*   (will switch to 80x25 mode)

WordStar Professional Release 4

1) Copy WS.EXE to, for instance, WS132.EXE.
2) Run WSCHANGE using WS132.EXE and save to WS132.EXE.
3) Create a batch file, for instance, WSVGA.BAT to do the following:

VGAMODE 51
WS132
VGAMODE 3

When all these are done, type WSVGA to start WordStar 4 in 132-column mode.

WordStar Version 3.30

To modify this version of WordStar to operate in 132-column mode, Oak has provided a utility called PATCHWS.EXE (the original installation program WINSTALL.COM is incapable of setting screen dimensions.)

1) Copy WS.COM to, for instance, WS132.COM.
2) Run PATCHWS.EXE on WS132.COM.
3) Create a batch file similar to WSVGA.BAT above.

Word Perfect Version 4.2

1) Use the setup option of Word Perfect to set the new display dimensions.
2) Create a batch file WPVGA.BAT to do the following:

VGAMODE 51
WP
VGAMODE 3

SECTION 9   SUPPLEMENTARY

VGA-1 CARD

9-1 INTRODUCTION

The VGA-1 card is a high performance card for your IBM PC, PC-XT, AT or its compatible personal computers. It can run digital and analog monitors.

9-2 MONITOR TABLE

MONITOR TABLE

Supported Modes	Digital Monitors			Analog Monitors	
	Monochrome	CGA	EGA	Multi-Frequency	Fixed-Frequency
0		Y	Y	Y	Y
1		Y	Y	Y	Y
2		Y	Y	Y	Y
3		Y	Y	Y	Y
4		Y	Y	Y	Y
5		Y	Y	Y	Y
6		Y	Y	Y	Y
7	Y		Y	Y	Y
D			Y	Y	Y
E			Y	Y	Y
F	Y		Y	Y	Y
10			Y	Y	Y
11				Y	Y
12				Y	Y
13				Y	Y
50				Y	
51				Y	
52				Y	

9-3 DIP SWITCH SETTING

For multi-frequency monitors, use the analog multi-frequency switch settings (such as NEC Multisync). For IBM 8503, 8512, 8513 or compatible color single frequency monitors use the PS/2 switch setting (XXX on for sw. 1,2,3,4). The switch settings are listed in the following table:

sw1	sw2	sw3	sw4	Configuration
on	on	on	on	IBM PS/2 Monitor
on	on	on	off	MDA Attached
off	on	on	off	CGA Attached
on	off	on	off	EGA Attached
off	off	on	off	NEC Multisync or Compatible
on	on	off	off	NEC Multisync Plus or Compatible
off	off	off	off	NEC Multisync 2A
on	off	off	off	NEC XL
off	off	off	off	Reserved
off	on	on	on	Non-IBM VGA monitor (mono)
on	off	on	on	Non-IBM VGA monitor (color)
off	off	on	on	Non-IBM VGA 16-inch (color)
X	X	off	on	Reserved

Notes: MDA = Monochrome Display (**Hsync = 18.4khz**)

CGA = Color Display (Hsync = 15.75khz)

EGA = Enhanced Color Display (Hsync = 21.85khz 15.7khz)
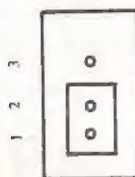
X   = Don't care
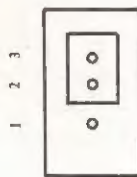
off = Open

on   = Close

Only IBM VGA Modes and 800x600 graphics modes (mode 52) are supported on NEC Multisync 2A monitors or compatibles.

9-4 Jumper Setting

Select 8 or 16 bit bus operation by the following settings:

8 bit setting:

NOTE: When 16 bit operation is selected, the video speed will increase. However, the user should take the notice that some of the peripheral cards, such as the RLL hard disk controller, will crash with the VGA card addressing lines and the computer will halt.

If the VGA card is set to 16 bit operation, it will automatically detect 8 bit or 16 bit operation depending on whether it is inserted into 8 or 16 bit slot.